PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants	:	Randy Keith Lomnes
Application No.	:	09/923,727
Filed	:	August 6, 2001
For	:	METHOD AND SYSTEM FOR AUTOMATICALLY PRESERVING PERSISTENT STORAGE
Examiner	:	Shen Jen Tsai
Art Unit	:	2186
Docket No.	:	470039.401

Commissioner for Patents
Washington, DC 20231

SUPPLEMENTAL DECLARATION OF RANDY KEITH LOMNES, Ph.D.
PURSUANT TO 37 C.F.R. §1.132

I, Randy Keith Lomnes, residing at 7934 Swanson View Drive, Pender Island, B.C. Canada, V0N2M2, declare as follows:

1.I am the sole inventor of the invention claimed in the above-identified patent application, U.S. Patent Application No. 09/923,727, with an effective filing date of August 8, 2000.

2.I have reviewed my previous declaration pursuant to 37 CFR 1.132 ("Original Declaration") filed on June 21, 2007 and confirm again that all statements therein are true. I am providing this declaration ("Supplemental Declaration") as a supplement to my Original Declaration, and I hereby incorporate by reference each and every paragraph of my Original Declaration.

3.There are several disadvantages to the peripheral card described by U.S. Patent No. 6,092,161 to White et. al (hereinafter "White").

4.One disadvantage of the peripheral card of White is its manufacturing cost. Hardware cards are expensive to design, debug, and manufacture compared to pure software-based approaches. This means the card costs more for the consumer.

5.Another disadvantage of the peripheral card of White is the firmware development cost. Writing code for peripheral cards that execute firmware instructions is often expensive compared to ordinary software development. For example, because the White peripheral card includes a separate processor (*e.g.*, a Z80) for executing its instructions, a developer would have to develop code within a simulation environment before the peripheral card is manufactured. The simulation environment has to accurately reflect the behavior of the peripheral card, or else the developed code will not execute properly on the peripheral card.

6.Another disadvantage of the peripheral card of White is installation cost. Installing new hardware is generally more expensive than installing new software, because the PC case needs to be opened up, the card plugged in, etc. Often a computer technician needs to be hired to do this.

7.Another disadvantage of the peripheral card of White is maintenance costs. Upgrading cards with new ROM chips is expensive compared to installing a software upgrade, for the same reasons as installing a new hardware is expensive, as discussed above.

8.Another disadvantage of the peripheral card of White is that the card only understands disk sectors and partitions. It cannot leverage any of the services provided by the operating system, such as tables of empty disk blocks, etc. This means that the White peripheral card can only operate on a partition-by-partition basis, and does not have much flexibility with respect to where it stores its redirected data.

9.My invention does not suffer from any of the above disadvantages of the White peripheral card. In particular, my invention is cost-effective in terms of purchase price, installation, maintenance, and upgrade costs. In addition, my invention can leverage functionality provided by the operating system. For example, it can ask the operating system for a list of available disk blocks, and then use those blocks to store redirected data. Accordingly,

my invention does not need to allocate a special partition for redirected data, which might result in underutilization of disk resources.

10.At the time of my invention, I knew of peripheral card-based solutions to the problem I was trying to solve and understood that they were not very effective, for the above reasons. Many of the companies selling peripheral cards for disk protection are now out of business.

11.I was trying to solve a different problem than the one addressed by White. In particular, I was trying to solve a problem faced by schools and libraries. Specifically, schools and libraries do not want their computer systems to get disrupted by files created by different users, but do not have the money to pay for all of the costs associated with hardware-based solutions, such as the one described by White. Schools and libraries need a cost-effective solution that matches their IT management infrastructure and methods, such as network-based software distribution and/or disk imaging solutions (*e.g.*, "ghosting").

12.Based on my prior experience designing hardware cards, I knew that hardware-based peripheral cards such as White would not provide any information about how to solve the problems I faced. I knew that a hardware-oriented solution would be too expensive and cumbersome for my purposes.

13.At the time of invention, I needed find a foolproof way of implementing a software redirection driver for 100% of disk traffic. Any disk accesses not under control of our software could cause a catastrophic system failure, because of inconsistencies in the system data structures (*e.g.*, file systems). It took considerable experimentation to develop the proper approach. As noted in my Original Declaration, paragraphs 4-8, peripheral cards such as White do not provide any information about redirecting disk accesses using a software driver, which is part of the operating system.

14.In addition, my solution had to be robust in the face of power outages.

15.Another challenge I faced was to find a uniform solution that would work in the face of the installation of new kinds of software. Previously, I tried other approaches that were

generally unsuccessful, such as disabling certain features/functions of different software packages. However, these approaches turned out to be unsatisfactory, because they were difficult to manage and maintain, especially when new or different kinds of software were installed.

16.Hyper Technologies Inc. launched a product that includes my invention, under the name DEEP FREEZE.

17.Various forms of DEEP FREEZE are now used in a substantial percentage, in excess of 25%, of the school market.

18.DEEP FREEZE users have consistently been impressed by its robustness and ease of use.

19.Also, DEEP FREEZE products have been widely licensed across various industries.

I hereby declare that all statements made herein are, to my own knowledge, true and that all statements made on information or belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the captioned patent application or any patent issued therefrom.

Date Aug 31, 2007

Randy Keith Lomnes, Ph.D.

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